

Remarks

Reconsideration of the present application, as amended, is respectfully requested. Response will be made with reference to the Examiner's comments and by the paragraph number in which such comments were made.

3. The Examiner has required that the title of the invention be amended, stating that the present title is not descriptive. The title has been amended to better clarify that the method and system of the present invention is operative to compensate *for* (i.e. correct for) undesired movement, motion, bending, etc. of probe cards, which can result from a thermal gradient across the thickness of the probe card. The title of the invention is otherwise believed to be clearly indicative of the invention to which the claims are directed.

4-5. The Examiner stated that it is unclear what "a temperature sensor" represents. Persons skilled in the art would understand "a temperature sensor" to be any sensor that detects or senses the temperature and relays a signal indicating such temperature. Such devices have long been known by persons skilled and unskilled in the art. Common examples, which are not intended to be exclusive, include mercury thermometers (with an optical output), thermocouples (varying voltage output) and thermistors (varying resistance output). A proposed amendment to Fig. 4 is enclosed, the amendment being to include temperature sensing elements 490, 495 incorporated in control elements 470, 475, as described at page 11, lines 15-16 in the specification. Approval of the amendment to Fig. 4 is respectfully requested. The specification at page 11, lines 15-16 has been amended to

include reference numbers 490/495. Claim 4 is believed to be allowable under 35 U.S.C.

112.

7. Claims 1-3 and 10 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Carlin et al. 5,124,639. The examiner states that Carlin et al. disclose “a probe card (50) [sic] for testing a die (24) and a heating element (48) located adjacent to the probe card at a portion of the probe card (probe ring “40”)” and notes that Carlin does not mention or teach using an energy transmissive element to selectively control geometric planarity of the probe card. The examiner then states that Carlin et al. teaches using heating element (48) to heat probe leads (22) in order to reduce probe lead shifting or drift, and that it would have been obvious for one of ordinary skill in the art to recognize that the heating elements (48) would be qualified as the energy transmissive element since it utilizes transmitted energy to selectively control geometric planarity of the probe card. Applicant respectfully traverses the Examiner’s rejection of claims 1-3 and 10.

Carlin et al. does include an energy transmissive element in heating element (48), such element being specifically taught to heat the central probe card ring 40 and the probe leads 22 supported by probe card ring 40 (Carlin et al., column 6, lines 16-18). Nowhere does Carlin et al. or any other reference of record teach use of energy transmissive element to selectively deflect a portion of said probe card to selectively control the geometric planarity of said probe card. In fact, Carlin et al. specifically addresses the problem of a warping probe card (col. 1, lines 64-68), and recites the solutions that have been advanced to solve the problem, including the addition of a “broad stiffener”, addition of a heat sink, using materials with low coefficients of thermal expansion, and moving the probe card and probe leads in

close proximity to the heated chuck to preheat the card and leads. In view of such recognition of the problem, Carlin et al.'s solution and teaching is to apply heat to the probe card ring 40 to heat the probe leads 22 to avoid probe lead drift. Carlin et al. nowhere suggests or teaches use of the heating element to selectively deflect a portion of said probe card to selectively control the geometric planarity of said probe card, as required by independent claim 1.

Further, the configuration of the Carlin et al. device includes a heating element located in the probe card ring 40, which is located at the center of the probe card 12. Such configuration would direct any heat radially outwardly resulting in a significant radial temperature gradient, which would result in an uneven temperature effect across the probe card. There is no indication in Carlin et al. that sufficient heat would or should even be generated from the center of the probe card ring to heat the probe card, let alone reach the outer portion of the probe card. In addition, if the heating element 48 in the probe card ring were used to generate sufficient heat to reach the outer portion of the ring, such level of heat could likely damage the probe leads 22 located closest to the heating element 48. Such use of heating element 48 would be taught against by Carlin et al. If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose then there is no suggestion or motivation to make the proposed modification. MPEP §2143.01. citing *In re: Gordon*, 221 USPQ 1125 (Fed. Cir. 1984).

Neither Carlin et al. nor any art of record anywhere discusses, teaches or suggests using the heating element 48 in probe card ring 40 to heat the probe card to selectively deflect a portion of said probe card to selectively control the geometric planarity of said

probe card. Moreover, such use of the heating element 48 in probe card ring 40 is not obvious; no motivation for modifying Carlin et al. to use the heating element 48 in probe card ring 40 to heat the probe card to selectively deflect a portion of said probe card to selectively control the geometric planarity of said probe card has been shown in any of the art of record; and, such modification of Carlin et al. could damage the probe leads and would be taught against.

Claims 2-3 and 10 are dependent from claim 1 and are believed to be allowable for the reasons presented above in favor of the patentability of claim 1. In addition, as to claim 2, there is no teaching or suggestion to locate the heating element 48 to the perimeter of the probe card. Such modification would move the heating element away from the probe leads, the precise aim of the Carlin et al. invention, and would be taught against. Claim 2 is believed to be allowable.

Claims 1-3 and 10 are believed to be allowable under 35 U.S.C. 103(a) in view of Carlin et al.

8. Claims 5, 12 and 23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Carlin et al., the Examiner stating that it would have been obvious “to provide a stiffener as taught by admitted prior art figure 3 to the device of Carlin et al. so that the probe card is secured properly during test.”

Claims 5 and 12 are dependent from claim 1, and are believed to be allowable for the reasons presented above in favor of the patentability of claim 1.

Claim 23 requires means for facilitating radial expansion/contraction of the probe card with respect to the stiffening element. The Examiner has cited no prior art that

describes, teaches or suggests the combination of claim 23, which includes means for facilitating radial expansion/contraction of said probe card with respect to said stiffening element, and claim 23 is believed to be allowable.

Further to the discussion above with regard to claim 1, combining the teachings of Carlin et al. with a stiffener as shown in figure 3 would not produce the invention of claim 5 and 12 because such combination does not provide an energy transmissive element that selectively deflects a portion of the probe card to selectively control the geometric planarity of the probe card, as required by claims 5 and 12.

In addition, it is well settled that to establish a *prima facie* case of obviousness there must be some suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify a reference or to combine reference teachings. MPEP §2143. Carlin et al. identify several prior art solutions to probe card warping and, in lieu of such solutions, Carlin et al. teaches heating the probe card ring 40 to heat leads 22. Such solution is deemed sufficient alone, and Carlin et al. do not teach or suggest that combining such probe card ring heating with a stiffener is desired or necessary. There is no motivation provided in any of the cited references to combine stiffeners as shown in figure 3 of the present application with the probe card ring heating element of Carlin et al., and claims 5, 12 and 23 are not believed to be obvious in view of Carlin et al. and the device shown in figure 3.

In view of the foregoing amendments and remarks, pending claims 1-5, 10-12 and 23 are believed to be allowable. The present application is believed to be in condition for allowance, and action in accordance therewith is respectfully requested. If the Examiner

believes any issues remain that may be resolved by telephone, he is invited to contact the applicant's undersigned representative to resolve such issues.

Respectfully Submitted,

By: R. Randall Frisk

R. Randall Frisk, Reg. No. 32,221
Woodard, Emhardt, Moriarty, McNett & Henry LLP
Bank One Center/Tower
111 Monument Circle, Suite 3700
Indianapolis, Indiana 46204-5137
(317) 634-3456

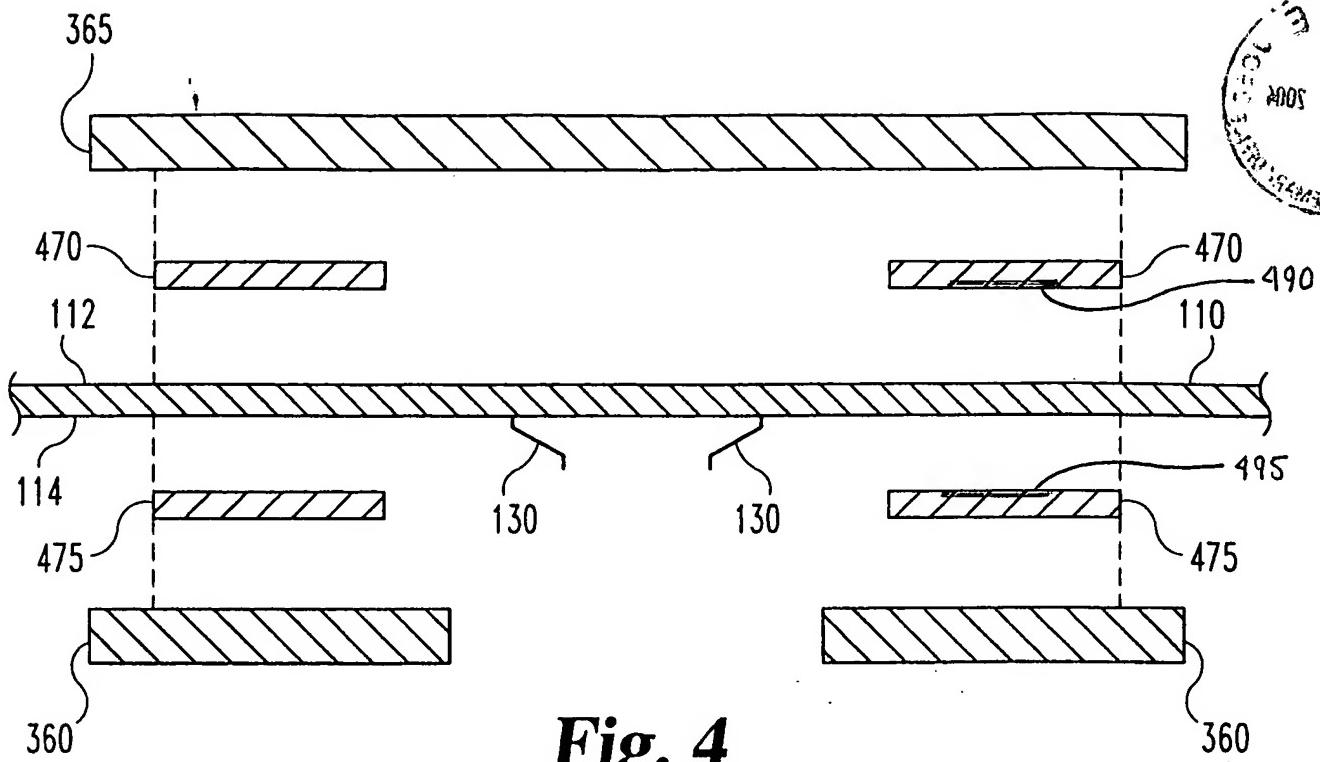


Fig. 4

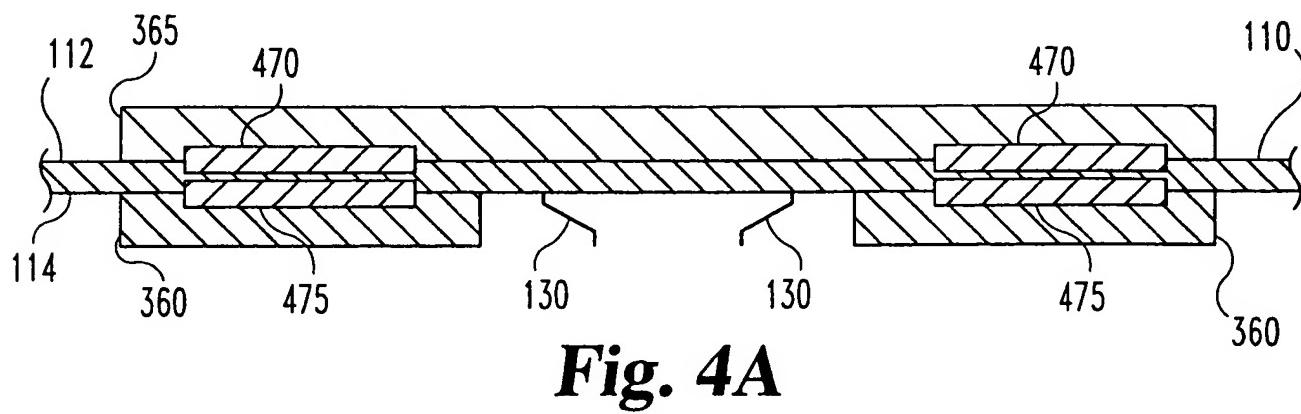


Fig. 4A

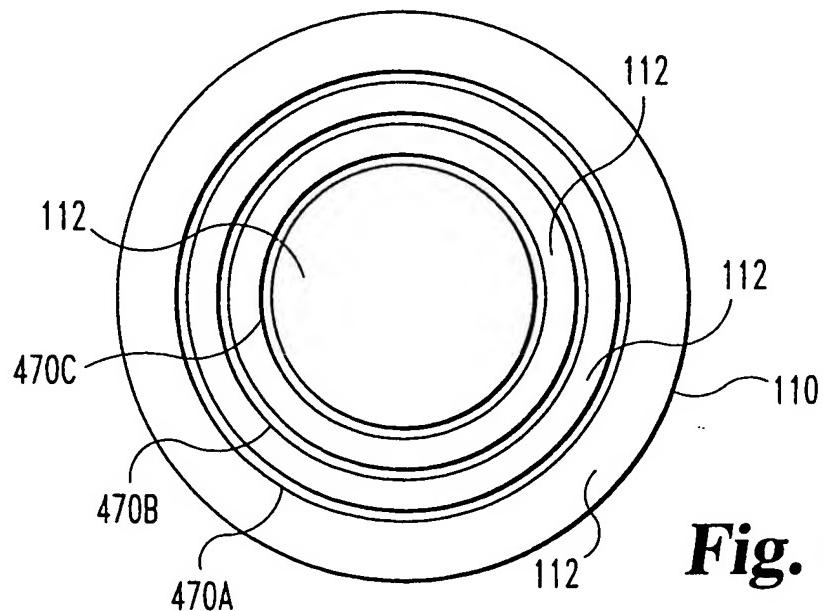


Fig. 4B